Amend claim 5 as follows:

--5. (amended) A scanning probe microscope for a sample, comprising:

A14

a probe having a body and a sharp end, said body and said sharp end including a single conductive material;

a piezoelectric element, provided at said body, for vibrating said sharp end along a direction approximately in parallel with a surface of said sample; and

a detector, coupled to said piezoelectric element, for detecting a vibration state of said probe.--

Amend claim 9 as follows:

A15

--9. (amended) The scanning probe microscope as set forth in claim 5, wherein said probe is electrically-isolated from said piezoelectric element.--

Amend claim 14 as follows:

--14. (amended) A scanning probe microscope for a sample, comprising:

a probe having a conductive sharp end;

A16

a moving unit for moving said sample along a Z-direction and moving said sample in X- and Y- directions;

a vibrating unit for vibrating said probe along a direction approximately in parallel with a surface of said sample;

a vibration detecting unit for detecting a vibration state of said probe;

a signal detecting unit for detecting an electrical characteristic signal between said probe and said sample;

A16 end

a control unit for controlling an interaction between said probe and said sample so that the interaction is brought close to a predetermined definite level; and

a voltage applying unit for applying an AC voltage to said sample.--

Amend claim 21 as follows:

--21. (amended) The scanning probe microscope as set forth in claim 14, wherein said signal detecting unit comprises;

a detector for detecting a signal from said probe;

a diode detector, connected to said detector, for detecting an output signal of said detector; and

A17

a frequency detector, connected to said diode detector, for detecting an output signal of said diode detector by using a frequency close to a frequency of said AC voltage as a reference.--

(Amend claim 22 as follows:)

--22. (amended) The scanning probe microscope as set forth in claim 14, wherein said signal detecting unit comprises;

a detector for detecting a signal from said probe;

a diode detector, connected to said detector, for detecting an output signal of said detector;

a first frequency detector, connected to said diode detector, for detecting an output signal of said diode detector

by using a frequency close to a frequency of said AC voltage as a reference; and

A17 cont'd

a second frequency detector, connected to said diode detector, for detecting an output signal of said diode detector by using a frequency close to a frequency of said AC voltage as a reference.--

Amend claim 24 as follows:

A18

--24. (amended) The scanning probe microscope as set forth in claim 14, wherein said electrical characteristic signal shows a differential component of a capacitance between said probe and said sample with respect to said AC voltage.--

Amend claim 26 as follows:

A19

--26. (amended) The scanning probe microscope as set forth in claim 14, wherein said electrical characteristic signal shows a second-order differential component of a capacitance between said probe and said sample with respect to said AC voltage and a vibration coordinate of said probe.--

Amend claim 28 as follows:

A20

--28. (amended) The scanning probe microscope as set forth in claim 14, wherein said electrical characteristic signal shows a differential component of a current flowing through said probe and said sample with respect to said AC voltage.--

Amend claim 30 as follows:

A21

--30. (amended) The scanning probe microscope as set forth in claim 14, wherein said electrical characteristic signal

A21 cncl

shows a second-order differential component of a current flowing through said probe and said sample with respect to said AC voltage and a vibration coordinate of said probe.--

Amend claim 35 as follows:

A22

--35. (amended) The scanning probe microscope as set forth in claim 14, wherein a frequency of said AC voltage is higher than a frequency of the vibration state of said probe.--

Amend claim 43 as follows:

A23

--43. (amended) A method for controlling a scanning probe microscope for a sample, comprising: a probe having a conductive sharp end; a moving unit for moving said sample along a Z-direction and moving said sample in X- and Y-directions; a vibrating unit for vibrating said probe along a direction approximately in parallel with a surface of said sample; a vibration detecting unit for detecting a vibration state of said probe; a signal detecting unit for detecting an electrical characteristic signal between said probe and said sample; a control unit for controlling an interaction between said probe and said sample so that the interaction is brought close to a predetermined definite level; and a voltage applying unit for applying an AC voltage to said sample,

said method comprising a step of adjusting a distance between the sharp end of said probe and said sample so that the detected vibration state of said probe is brought close to a predetermined definite level.--

Amend claim 44 as follows:

--44. (amended) A method for controlling a scanning probe microscope for a sample, comprising: a probe having a conductive sharp end; a moving unit for moving said sample along a Z-direction and moving said sample in X- and Y-directions; a vibrating unit for vibrating said probe along a direction approximately in parallel with a surface of said sample; a vibration detecting unit for detecting a vibration state of said probe; a signal detecting unit for detecting an electrical characteristic signal between said probe and said sample; a control unit for controlling an interaction between said probe and said sample so that the interaction is brought close to a predetermined definite level; and a voltage applying unit for applying an AC voltage to said sample,

A24

said method comprising a step of adjusting a distance between the sharp end of said probe and said sample so that the detected electrical characteristic signal is brought close to a predetermined definite level.--

Amend claim 46 as follows:

--46. (amended) The method as set forth in claim 44, further comprising the steps of:

A25

detecting a signal from said probe by a detector;

detecting an output signal of said detector by a diode; and

detecting an output signal of said diode by using a frequency close to a frequency of said AC voltage as a reference.--

(Amend claim 47 as follows:)

A25 end

--47. (amended) The method as set forth in claim 44, further comprising the steps of:

detecting a signal from said probe by a detector;

detecting an output signal of said detector by a diode; and

detecting an output signal of said diode by using a frequency close to a frequency of said AC voltage as a reference and by using a frequency close to a vibration frequency of said probe as a reference.--

Amend claim 50 as follows:

A26

--50. (amended) The method as set forth in claim 43, wherein a frequency of the vibration state of said probe is lower than a frequency of said AC voltage.--

Amend claim 55 as follows:

--55. (amended) A scanning probe microscope for a sample, comprising:

a moving unit for moving said sample in X-, Y- and Z-directions;

A27

a conductive probe approximately perpendicular to a surface of said sample and having a sharp end capable of being in proximity to the surface of said sample;

an oscillator;

a vibrating unit, connected to said oscillator, for vibrating said conductive probe in the X-direction in accordance with a frequency of said oscillator;

a vibration detecting unit for detecting a vibration amplitude of said conductive probe to generate a vibration voltage;

A27 Cont'd

a feedback control unit, connected between said vibration detecting unit and said moving unit, for controlling a location of said sample in the Z-direction in accordance with the detected vibration amplitude of said vibration detecting unit, so that the vibration amplitude of said vibrating detecting unit is brought close to a predetermined definite value

an AC voltage modulation circuit, connected to said sample, for supplying an AC modulation voltage to said sample; and

a sensor, connected to said conductive probe, for detecting an electrical characteristic signal showing a state of said sample immediately below the sharp end of said conductive probe. --

Amend claim 58 as follows:

A28

--58. (amended) The scanning probe microscope as set forth in claim 56, further comprising a second lock-in amplifier, connected to said capacitance sensor, for detecting a differential component of a capacitance signal of said

capacitance sensor with respect to said AC modulation voltage using a frequency thereof as a reference.--

A28 end

(Amend claim 59 as follows:)

--59. (amended) The scanning probe microscope as set forth in claim 58, further comprising a third display unit for displaying the differential component of the capacitance signal of said capacitance sensor with respect to said AC modulation voltage while a predetermined area of said sample in the X- and Y-directions is scanned by said conductive probe using said moving unit.--

Amend claim 62 as follows:

A29

--62. (amended) The scanning probe microscope as set forth in claim 60, further comprising a fourth lock-in amplifier, connected to said third lock-in amplifier, for detecting a second-order differential component of the capacitance signal of said capacitance sensor with respect to the vibration direction of said conductive probe and said AC voltage by said AC modulation voltage using a frequency thereof as a reference.--

Amend claim 64 as follows:

A30

--64. (amended) The scanning probe microscope as set forth in claim 56, further comprising:

a second lock-in amplifier, connected to said capacitance sensor, for detecting a first differential component of a capacitance signal of said capacitance sensor with respect

to said AC modulation voltage using a frequency thereof as a reference;

a third lock-in amplifier, connected to said capacitance sensor, for detecting a second differential component of a capacitance signal of said capacitance sensor with respect to a vibration direction of said conductive probe using a frequency of said oscillator as a reference;

a computer, connected to said first and second lock-in amplifiers, for calculating a ratio of said second differential component to said first differential component; and

a sixth display unit for displaying information relating to said ratio while a predetermined area of said sample in the X- and Y-directions is scanned by said conductive probe using said moving unit.--

(Amend claim 65 as follows:)

--65. (amended) The scanning probe microscope as set forth in claim 56, further comprising:

a second lock-in amplifier, connected to said capacitance sensor, for detecting a first differential component of a capacitance signal of said capacitance sensor with respect to said AC modulation voltage using a frequency thereof as a reference;

a third lock-in amplifier, connected to said capacitance sensor, for detecting a second differential component of a capacitance signal of said capacitance sensor with respect

to a vibration direction of said conductive probe using a frequency of said oscillator as a reference;

A30 end

a computer, connected to second and third lock-in amplifiers, for calculating a ratio of said second differential component to said first differential component and calculating an integration value of said ratio in the X-direction,

a sixth display unit for displaying said integration value while a predetermined area of said sample in the X- and Y-directions is scanned by said conductive probe using said moving unit.--

Amend claim 68 as follows:

A31

--68. (amended) The scanning probe microscope as set forth in claim 66, further comprising a fifth lock-in amplifier, connected to said current sensor, for detecting a differential component of a current signal of said current sensor with respect to a voltage of said AC modulation voltage using a frequency thereof as a reference.--

(Amend claim 69 as follows:)

--69. (amended) The scanning probe microscope as set forth in claim 68, further comprising an eighth display unit for displaying the differential component of the current signal of said current sensor with respect to said AC modulation voltage while a predetermined area of said sample in the X- and Y-directions is scanned by said conductive probe using said moving unit.--

Amend claim 72 as follows:

--72. (amended) The scanning probe microscope as set forth in claim 70, further comprising a seventh lock-in amplifier, connected to said sixth lock-in amplifier, for detecting a second-order differential component of the current signal of said current sensor with respect to the vibration direction of said conductive probe and said AC voltage by a frequency of said oscillator as a reference and said AC modulation voltage using a frequency thereof as a reference.--

A32

Amend claim 74 as follows:

--74. (amended) The scanning probe microscope as set forth in claim 55, wherein a frequency of said AC modulation voltage is higher than a frequency of the vibrating unit.--

(Amend claim 74, second appearance, as follows:)

--75. (amended) The scanning probe microscope as set forth in claim 64, wherein said ratio shows information regarding a slope of a concentration of majority carriers in equilibrium with respect to said vibration direction when said AC modulation voltage is small so as not to generate an inversion region in said sample.--

A33

(Amend claim 75 as follows:)

--76. (amended) The scanning probe microscope as set forth in claim 64, wherein said ratio shows information regarding a slope of a concentration of ionized dopants with respect to